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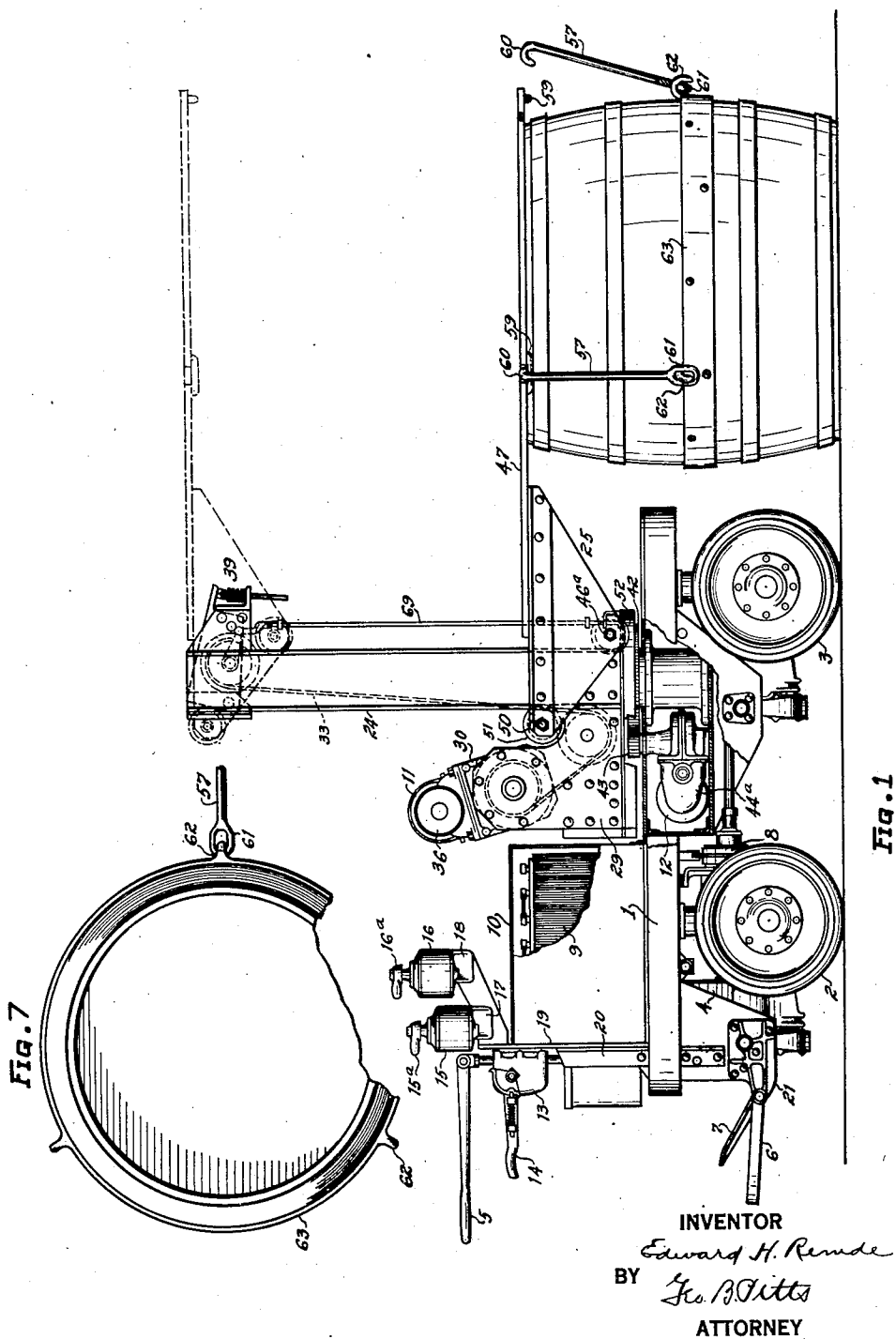
E. H. REMDE

1,929,447

INDUSTRIAL TRUCK

Filed July 16, 1930

6 Sheets-Sheet 1



Oct. 10, 1933.

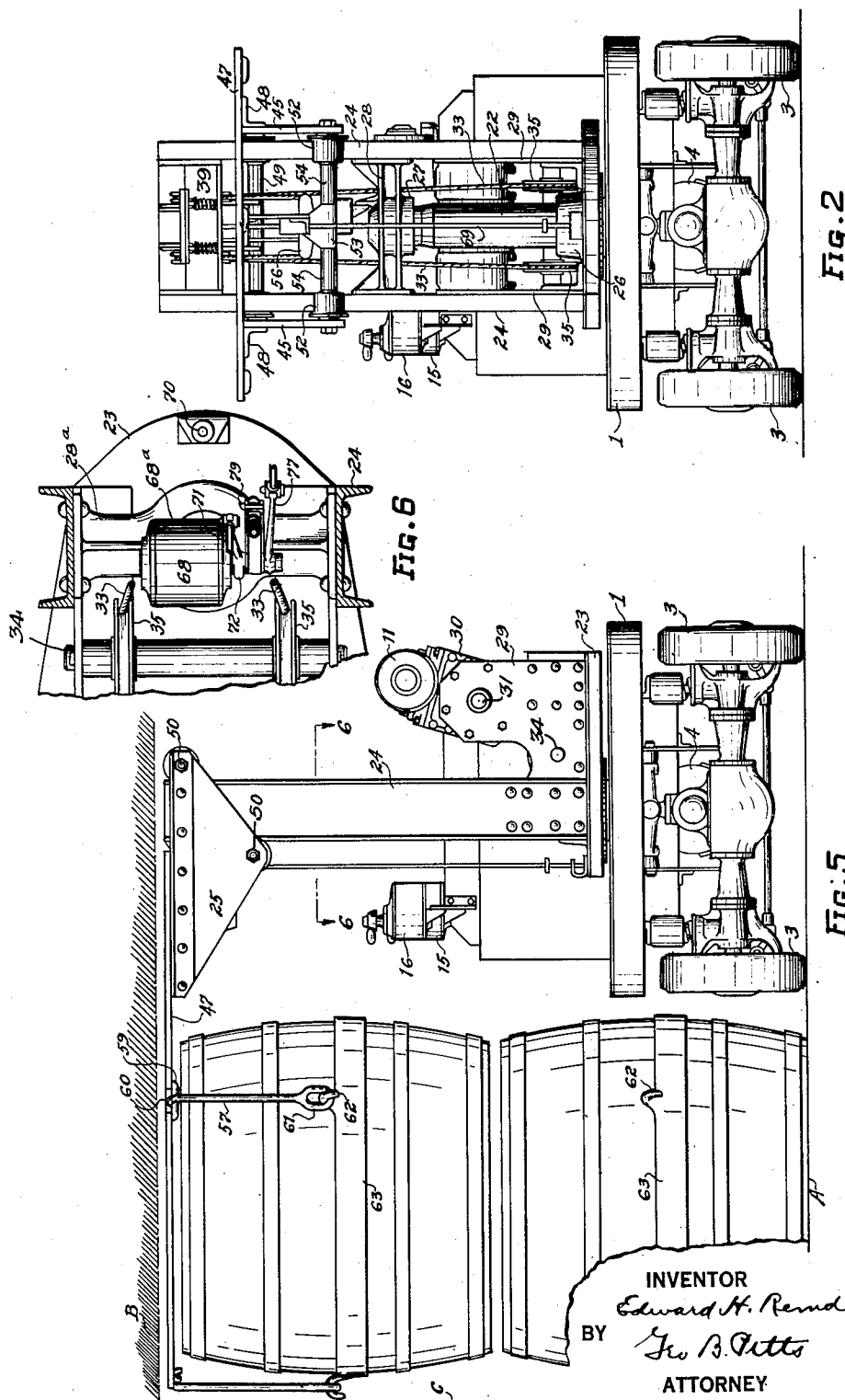
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INDUSTRIAL TRUCK

Filed July 16, 1930

6 Sheets-Sheet 2



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INDUSTRIAL TRUCK

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6 Sheets-Sheet 3

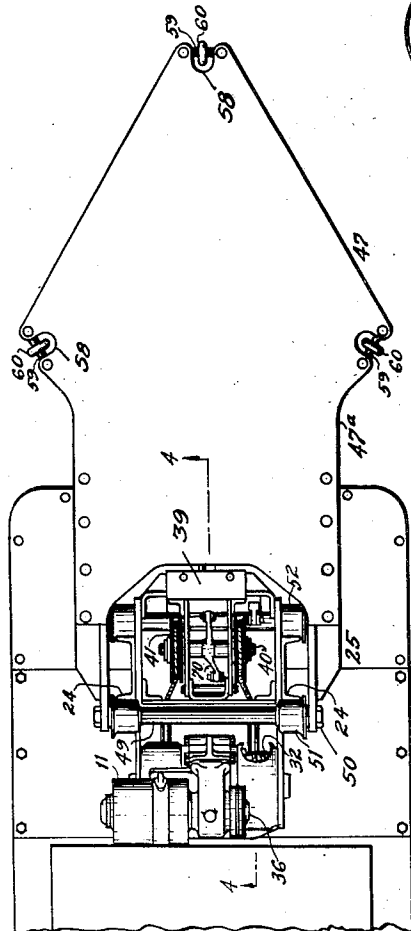
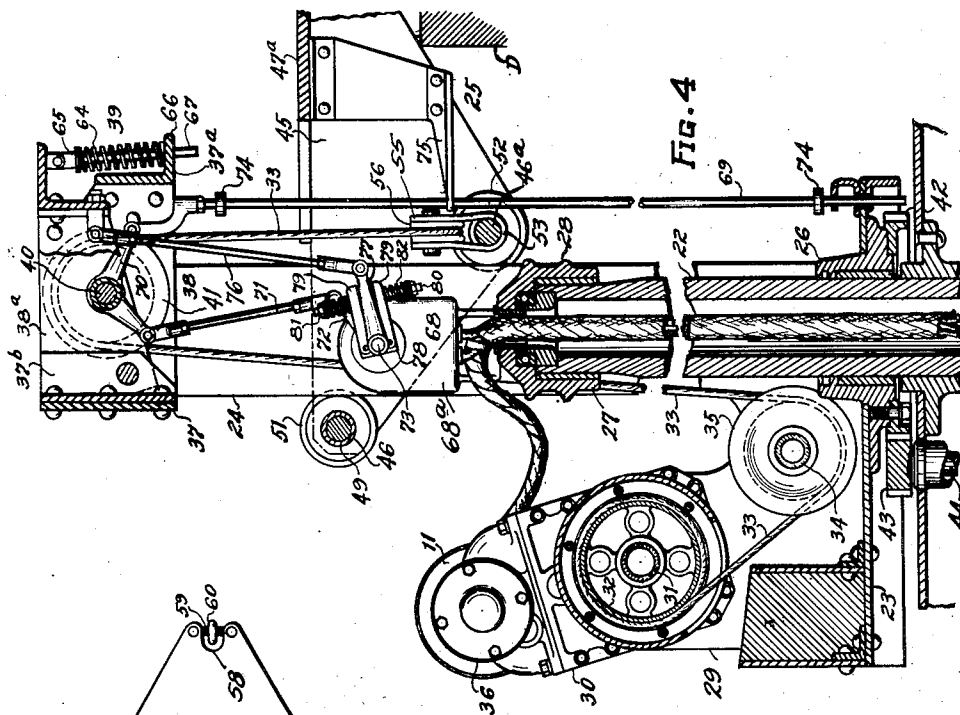


Fig. 3

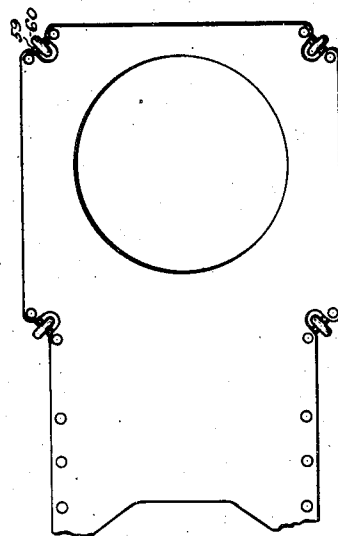


Fig. 8

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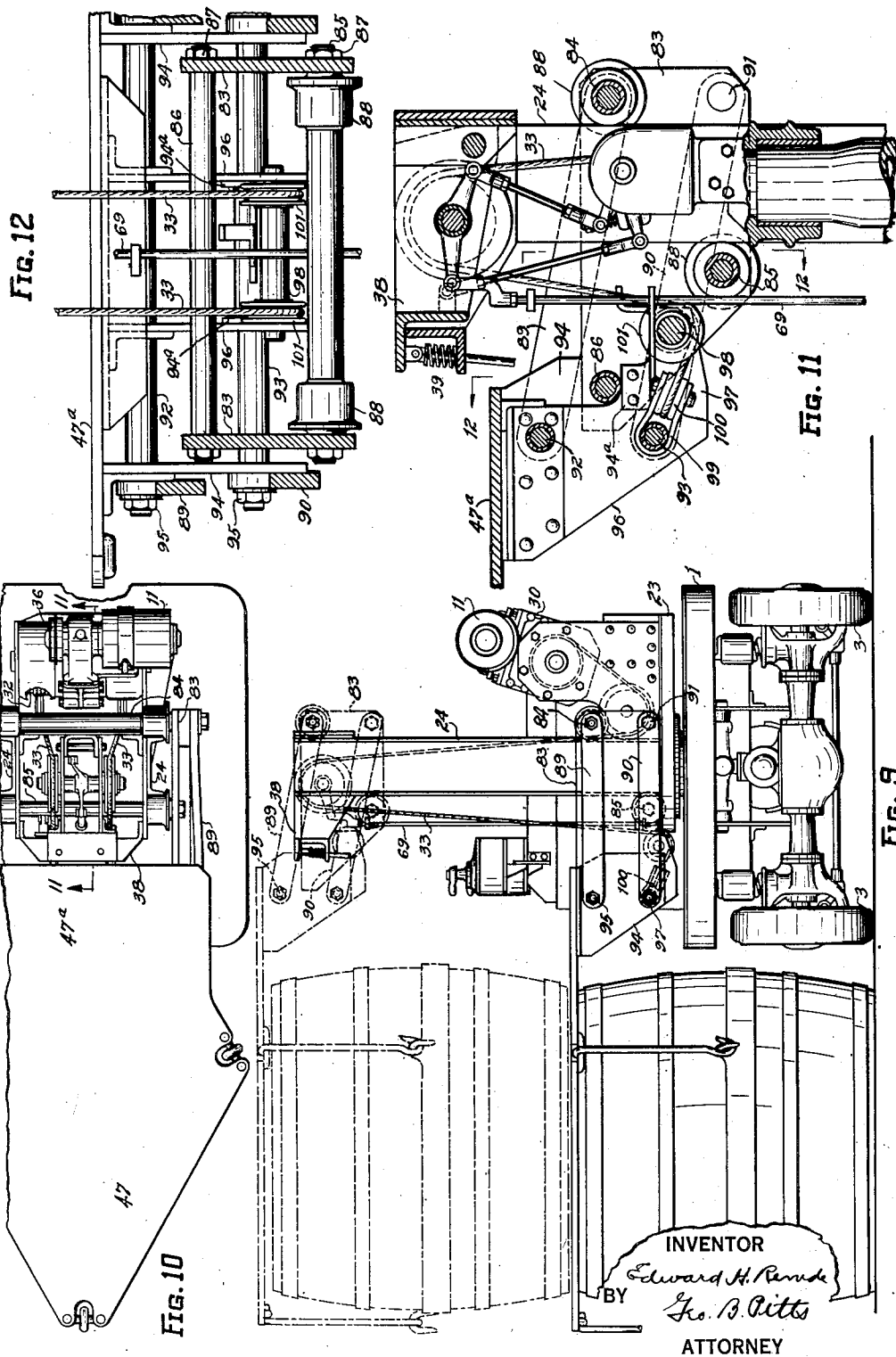
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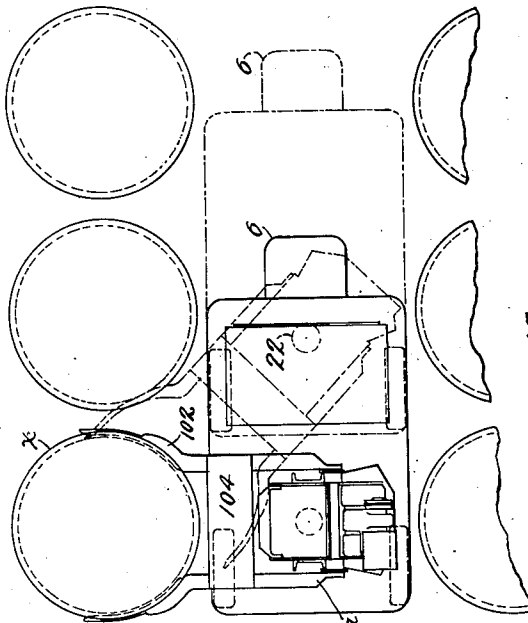


FIG. 15.

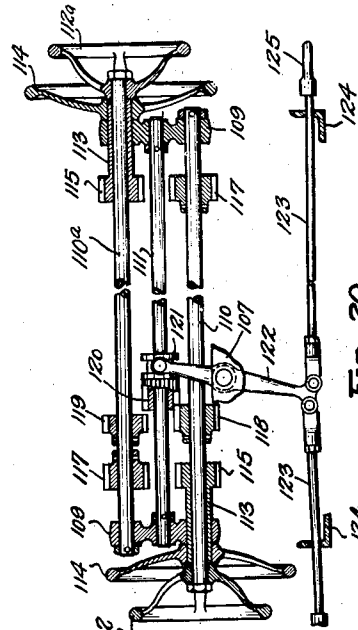


FIG. 20.

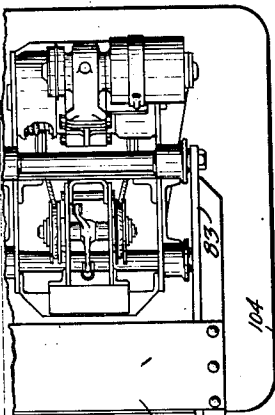


FIG. 14.

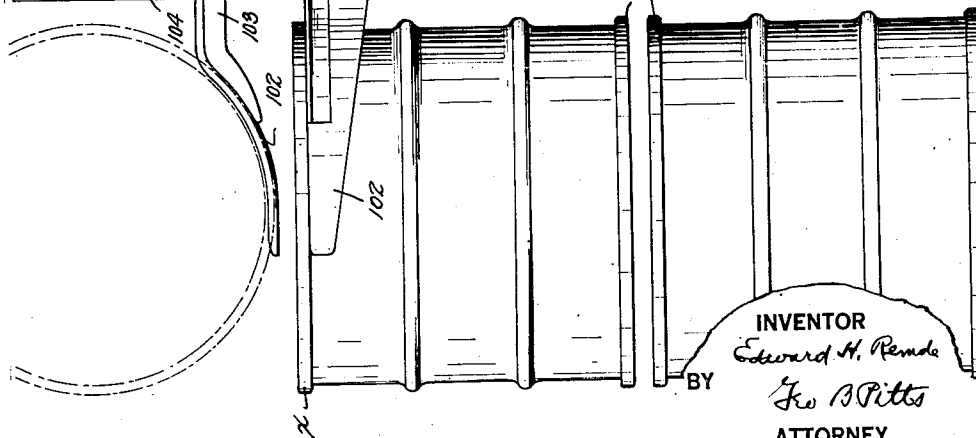


FIG. 13.

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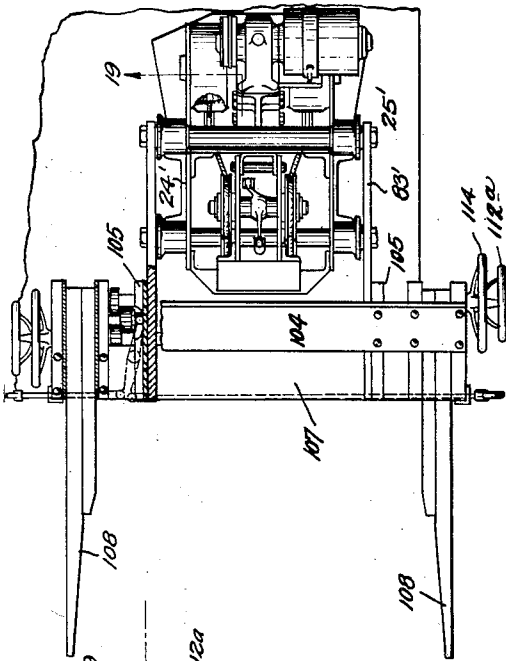


FIG. 17.

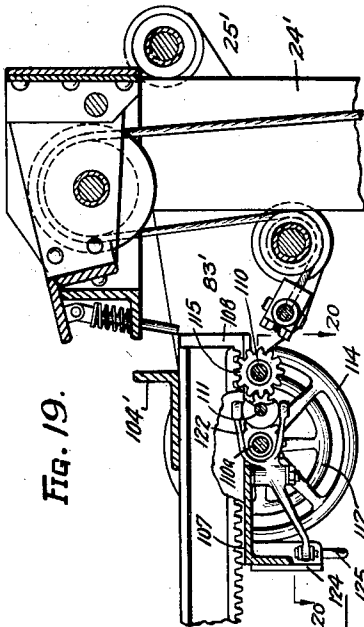


FIG. 19.

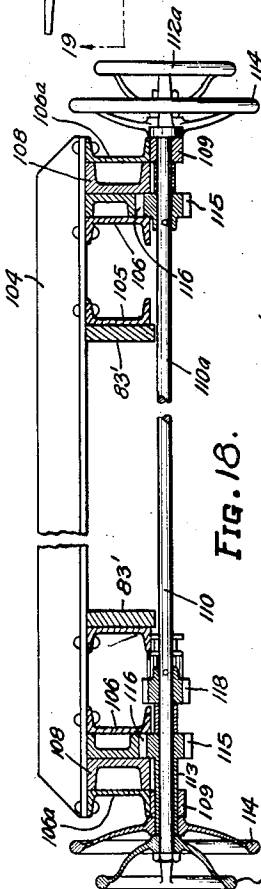


FIG. 18.

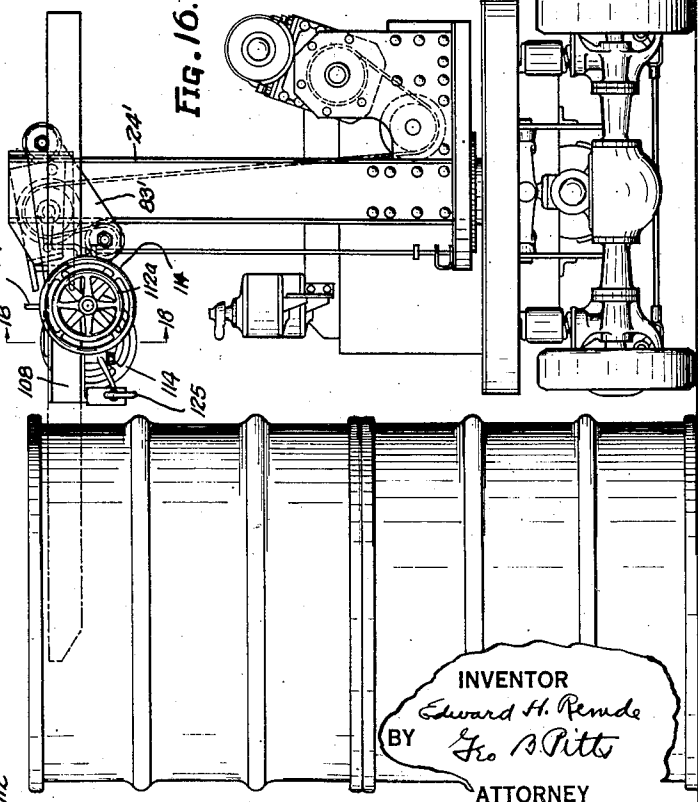


FIG. 16.

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UNITED STATES PATENT OFFICE

1,929,447

INDUSTRIAL TRUCK

Edward H. Remde, Cleveland, Ohio, assignor to
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a corporation of Ohio

Application July 16, 1930. Serial No. 468,374

7 Claims. (Cl. 212—64)

This invention relates to an industrial truck of the elevating type.

One object of the invention is to provide an elevating truck in which the elevating member is of an improved form adapted to engage and lift loads, stack loads one on another and discharge them on supports without the use of dunnage or equivalent devices.

Another object of the invention is to provide an elevating truck having an improved load engaging means adapted to engage the load above its lower surface in such manner that it may be stacked relatively close to the ceiling and removed when so stored.

Another object of the invention is to provide a power driven truck having an improved load engaging means adapted to be both elevated and slewed to either side of the truck, whereby loads may be stored side by side close to the driving lane and separately removed.

Another object of the invention is to provide in an elevating truck improved load engaging means adapted to be swung over the top of the load and having driving devices which engage the load to lift it.

Another object of the invention is to provide an elevating truck in which the elevating member is provided with a pair of extensible arms which are movable into and out of operative relation to a load, whereby the load may be readily lifted for transportation or discharged.

Another object of the invention is to provide an elevating truck in which the load lifting and carrying devices may be raised to a position above the normal travel of the elevating member, whereby the truck may be driven below overhead beams and the like which are lower than the range of upward movement of the load lifting and carrying devices.

Other objects of the invention will be apparent to those skilled in the art to which my invention relates from the following description taken in connection with the accompanying drawings, wherein,

Fig. 1 is a side view of a truck embodying my invention, parts being broken away; this view also illustrating the operation of engaging a load to lift and transport it.

Fig. 2 is a front elevation of the truck.

Fig. 3 is a fragmentary plan view.

Fig. 4 is a fragmentary section on the line 4—4 of Fig. 3.

Fig. 5 is an elevation, similar to Fig. 2, but showing the elevating member slewed to one side

of the truck frame and lifting the uppermost load of a stack.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary view showing the operation of connecting a load engaging device to a load.

Fig. 8 is a fragmentary plan view showing a slight modification of the lifting member.

Fig. 9 is a view similar to Fig. 5, but showing a differently constructed elevating member.

Fig. 10 is a fragmentary plan view of parts shown in Fig. 9.

Fig. 11 is a fragmentary section on the line 11—11 of Fig. 10.

Fig. 12 is a section on the line 12—12 of Fig. 11.

Fig. 13 is an elevational view of a truck embodying my invention, but in which the load engaging devices comprise arms arranged to engage the load at opposite sides thereof; the elevating member being shown in load lifting position.

Fig. 14 is a fragmentary plan view of the truck shown in Fig. 13.

Fig. 15 is a plan view showing two rows of containers and a truck of the construction shown in Figs. 13 and 14 operating in the aisle between the rows to discharge or lift a load.

Fig. 16 is an elevational view of a truck embodying my invention, but in which the load engaging devices comprise a pair of arms movable into and out of operative relation to the load; the arms being in retracted position, but shown projected in dotted lines.

Fig. 17 is a fragmentary plan view of the truck shown in Fig. 16.

Fig. 18 is a section on the line 18—18 of Fig. 16.

Fig. 19 is a section on the line 19—19 of Fig. 17.

Fig. 20 is a section on the line 20—20 of Fig. 19.

The present invention is particularly adapted for transporting containers and storing them in tiered or stacked relation in a storage room and removing them therefrom. By the term containers, I have in mind sheet metal drums having straight or bulged sides, barrels and casks. As these forms of loads do not readily admit of the use of dunnage, a truck having an elevating member which is constructed to be projected below the load to lift it cannot be used. Furthermore, in certain lines of industry, it is practice to fill containers with edible products and to then store them in specially built storing rooms for a predetermined period of time, and these rooms are usually of a height to accommodate two filled containers in stacked relation with only enough head room above the uppermost con-

tainer to permit of lateral sliding of the latter into and out of position. For example, in packing houses it is customary to provide storing rooms arranged to accommodate two containers between the floor A and ceiling B and to position a row of tiered containers along each side wall C, as shown in Fig. 5 and to leave between the rows an aisle, whereby access may be had to each container of each tier. Under these conditions the use of dunnage would so decrease the space between the lower container and the ceiling that a truck of the type above referred to could not position a second container on the lower container or remove it therefrom.

As will be understood from the following description, my invention is particularly adapted for positioning containers which are stored in the above described manner and for removing them since the elevating member in each embodiment illustrated engages the container at a point above its bottom and operates to lift the load without engaging the ceiling.

Referring to Figs. 1 to 12, inclusive, 1 indicates as an entirety a frame of suitable construction mounted on pairs of wheels 2, 3, both pairs of wheels being preferably driven by a motor 4 and the former pair being steered by a lever 5. The pairs of wheels, the driving mechanism therefor, the mounting for the wheels and driving mechanism and steering gear may be similar to that shown and described in Letters Patent No. 1,628,145 granted jointly to me and John H. Hertner, of Cleveland, Ohio. 6 indicates a platform for the operative. 7 indicates a foot pedal associated with the platform and controlling a brake 8, the latter being normally biased into braking position, but released when the pedal is depressed, as is customary in trucks of this general character. 9 indicates suitable storage batteries mounted on the rear portion of the frame and enclosed in a suitable sheet metal casing 10, the batteries serving to supply current to the motor 4, and also to motors 11 and 12, which will be later referred to. 13 indicates a controller for the motor 4 operated by a lever 14. 15 indicates a controller for the motor 11 operated by a handle 15a. 16 indicates a controller for the motor 12 operated by the handle 16a. The controllers 15, 16, are mounted on brackets 17, 18, respectively, secured to a dash 19, which in turn is supported by uprights 20, the latter extending downwardly and supporting suitable brackets 21 supporting the platform 6 and pedal 7.

22 indicates a mast or vertical shaft suitably supported in or on the forward portion of the frame 1.

23 indicates a base on which are rigidly mounted spaced channels 24, 24, serving as a guide for an elevating member indicated as an entirety at 25. The base 23 is provided with a collar 26, which has bearing on the lower portion of the shaft 22. 27 is a collar, which has bearing on the upper portion of the shaft 22. The upper collar 27 forms part of a casting 28 disposed between and connected to the guides to brace the latter and the collar 27. By this arrangement the collars rotatably support the base 23 and guides on the shaft, whereby the guides and the elevating member may be slewed to either side of the truck frame, one such position being shown in Fig. 5. 29 indicates spaced plates secured to the base 23 and guides 24 and forming a support for (a) a housing 30 enclosing a driving mechanism, geared to and driven by the motor 11, the shaft 31 driven by the driving mechanism having secured to it drums 32 for hoisting

cables 33 and (b) a shaft 34 for sheaves 35 around which the cables 33 run. 36 indicates a magnetically controlled brake for the shaft of the motor 11. The driving mechanism for the drums 32, the brake 36, the motor 11 and its mounting may be similar to corresponding parts shown in my co-pending application Serial No. 42,559, filed July 9, 1925, except that cable winding drums on the driven shaft (31) are substituted for sprockets. The guides 24 are secured together at their upper ends by cross plates 37, 37a, a U-member 37b on the rear plate 37 providing a support for a cradle 38, which forms part of a cable slack take-up means indicated as an entirety at 39. The side members 38a of the cradle support a shaft 40 for sheaves 41. As shown in Fig. 4, the cables extend from the sheaves 35 to and around the sheaves 41 from which they extend downwardly to engage the elevating member 25.

From the foregoing description, it will be understood that the plate 23, side walls 29, guides 24 and parts carried thereby swing or rotate as a unitary structure about the shaft 22, so that the elevating member may be positioned for operation at either side of the truck frame (see Fig. 5.) To rotate the base 23 and parts carried thereby, I secure to the collar 26 a ring gear 42 with which meshes a pinion 43, fixed to a shaft 44. The shaft 44 is driven through a suitable reduction gearing, within a housing 44a by the motor 12.

In the form of construction shown in Figs. 1, 2, 3, 4 and 5, the elevating member comprises the following: 45, 45, indicate side plates connected together by a pair of rods 46, 46a, and the tail portion 47a of a laterally extending or overhanging lift member 47, which is disposed on top of the side plates for a reason which will later appear. The plates 45, 45, are held in spaced relation by the tail portion 47a, to which they are secured by angles 48 and a sleeve 49 surrounding the rod 46, the plates being clamped against the ends of the sleeve by nuts 50. The sleeve 49 and rod 46a are provided with suitable bushings on which upper and lower pairs of rollers 51, 52, loosely rotate, these rollers engaging the opposite sides of the guides 24 to slidably support the elevating member 25 thereon, whereby the latter may be raised and lowered. 53 indicates a yoke swivelled on the rod 46a and held centrally thereof by spacing sleeves 54. The upwardly extending arms 55 of the yoke pivotally support between them an equalizing bar 56 to the outer ends of which are connected the outer ends of the hoist members or cables 33.

The laterally extending lift member 47 is disposed on the upper edges of the plates 45 so as to be in a plane above the elevating member 25 when the latter is raised to its extreme upper position as permitted by the height of the guides 24. The lift member comprises a horizontally disposed plate so that it may be swung in a horizontal plane over or into position above the load to be lifted, such arrangement and construction being advantageous where the space between the load and the ceiling is very limited, such for example as shown in Fig. 5. The lift member 47 is of a length to overlie the load either at the front of the truck frame 1 (Fig. 1) or at either side thereof (Fig. 5), whereby its marginal portions may support or carry one or more depending load engaging devices 57 adapted to engage elements on the lateral sides of the load. In the construction shown, the marginal edges of the lift member are formed with recesses 58 bridged by a transverse member

59 adapted to be removably engaged by a hook 60 on the upper end of a load engaging device 57. Each load engaging device preferably comprises a bar carrying the hook 60 at its upper end and a loop 61 at its lower end adapted to engage a hook 62 provided on the load. In the illustrated application of the invention, the casks are provided with a band 63 having hooks at a plurality of points around the cask. It will be understood that the load engaging devices may be variously constructed to meet the shape or kind of load and the means which may be provided thereon for engagement, and that they may be connected to the lift member in any desired manner. Each device may consist of a chain or section of cable instead of a bar. I may provide as many devices as found necessary, three being shown in Fig. 3 and four being shown in Fig. 8; also, the central portion of the lift member may be cut away, as shown in Fig. 8, when desired.

The cradle 38 of the slack take-up mechanism 39 is pivotally mounted at its inner end on the U-member 37b and its outer end is normally held down, by the weight of the elevating member against the tension of a plurality of springs 64, each mounted between an abutment 65 carried by the outer end of the cradle and the projecting flange 66 of the plate 37a. Each spring 64 surrounds a rod 67 pivoted to the cradle 38 and swingable and slidable at its lower end in an opening formed in the flange 66, the rod serving as a guide for the spring and the enlarged upper end of the rod serving as the spring abutment 65. The slack take-up means is arranged to operate in the event the elevating member 25 meets an obstruction (such as shown at D in Fig. 4) in its downward movement or the operative fails to stop the motor 11 when the lift member 47 engages the top of a load. The slack take-up means is connected to a limit switch mechanism 68, which serves to open the circuit for the motor 11 to stop the latter to prevent slack resulting after the slack take-up means has operated. The switch mechanism 68 is preferably similar to the mechanism disclosed and claimed in Letters Patent No. 1,726,717, dated September 3, 1929. No claim is made to the slack take-up means as that forms the subject matter of an application filed by me, May 31, 1928, Serial No. 281,704 (see Letters Patent 1,773,860, dated August 26, 1930).

69 indicates a rod extending parallel to the guides 24, being guided at its lower end by the walls of an opening formed in the base 23 and connected at its upper end to one arm of a bell-crank 70 fulcrumed on the shaft 40. The other arm of the bell-crank is connected by a link 71 to an arm 72 fixed to a rock shaft 73. The rock shaft 73 carries within the casing 68a of the limit switch mechanism 68 an operating member which opens either switch thereof depending on the direction of movement of the rock shaft. The rod 69 carries near its upper and lower ends adjustable tappets 74, one being engaged by a bracket or arm 75 suitably carried by the elevating member when the latter moves upwardly to its limit of movement and the other being engaged by the bracket when the elevating member moves downwardly to its limit of movement.

The cradle 38 is connected by a link 76 to an arm 77, loosely mounted on the rock shaft 73 and is connected to the shaft in the following manner: 78 indicates a collar fixed to the shaft 73 and carrying a pair of pivoted arms 79 normally disposed parallel to the arm 77. The arm 77 carries on its inner side a lug (not shown) ar-

ranged to engage and swing either arm 79 depending on the direction of movement of the arm 77. 80 indicates a rod slidably mounted in openings formed in the arms 79 and carrying collars 81 at its opposite ends. 82 indicates a coiled spring surrounding the rod 80 and interposed between each collar 81 and the adjacent arm 79. By reason of this arrangement, the movement of the arm 77 will act through the lug and one arm 79, adjacent spring 82 and collar 81 to move the rod 80 substantially endwise, and the rod in turn through the other collar 81, adjacent spring 82 and arm 79 will rotate the rock shaft to operate the switch mechanism. Where the switch mechanism is operated by the arm 72, the rock shaft 73 will rock the collar 78 and swing one of the pivoted arms 79, which will carry the rod 80 with it, whereas the other arm 79 will be held by the lug on the arm 77; as a result, the springs 82 will be compressed by the movement of the rod 80 and hence the arm 77 and its connections with the cradle 38 will remain stationary.

In Figs. 9 to 12, I have illustrated a form of construction in which the total height of the truck is reduced while providing for the movement of the lift member to a plane above the guides. This arrangement permits the truck to be driven below overhead beams and the like, with or without a load on its elevating member, while providing for movement of the load lifting and carrying devices to a higher position; for example where the containers are stored in rooms of the character hereinbefore referred to, the sills at the top of the doors are usually disposed in a plane below the ceilings. In this form of construction, the guides terminate at a point low enough to permit the truck to be driven through the doors, but the lift member may be elevated above the guides so as to handle casks stored in the manner described.

In this form of construction, the elevating member comprises a pair of plates 83 connected by rods 84, 85 and 86, each rod being provided with a sleeve against the ends of which the plates are clamped by nuts 87. 88 indicates pairs of rollers mounted on suitable bushings carried by the sleeves of the rods 84, 85, and arranged to engage the guides 24 to slidably support the elevating member thereon. 89, 90, indicate pairs of upper and lower parallel links, the inner ends of the upper links being pivoted on the sleeve for the rod 84 and the inner ends of the lower links being pivoted on stud shafts 91 projecting outwardly from the plates 83. The outer ends of the pairs of links 89, 90, are pivotally connected to shafts 92, 93, respectively supported by a pair of brackets 94 depending from the tail portion 47a of the lift member 47, the links being held on the shafts 92, 93, by nuts 95. 96 indicates a pair of supports depending from the tail portion 47a between the brackets 94 and also inwardly of the plates 83 and having inturned portions 97 which support a rod 98. The supports 96 are formed with openings through which the rods 92, 93, extend. The rods are preferably surrounded by sleeves between the supports 96 and also between the supports and the brackets 94 to maintain the parts in spaced relation. The shaft 93 carries a yoke 99 to which is pivotally connected an equalizing bar 100 and the rod 98 serves as a shaft for guide sheaves 101 around which the cables 33 run, the free ends of the cables being connected to the outer ends of the equalizing bar 100. As the cables 33 are connected through these parts to the lift member 47

and the latter is swingably mounted by the links 89, 90, on the elevating member, it will be seen that pull of the cables will serve to swing the lift member upwardly relative to the elevating member in raising the latter, until the offset portions 94a of the plates 94 engage the cross rod 86, which will act as a stop, so that continued pull on the cables will raise the elevating member and lift member as a unit. Accordingly, when the cables are operated to raise these parts, the lift member will be elevated to a position above the upper ends of the guides, as shown in dotted lines in Fig. 9. Due to the pull of the cables, the lift member is maintained elevated with respect to the elevating member during its raising and lowering movements, but upon lowering of the elevating member into engagement with the base 23, the tension on the cables 33 may be relieved and allow the lift member to swing downwardly, as where it is necessary to permit connection with or disconnection from the load, as shown in full lines in Fig. 9. As the links 89, 90 are disposed in parallel relation, the lift member 47 is maintained in horizontal position when raised or lowered relative to the elevating member.

The load engaging devices may be removed or separated from the lift member during the positioning of the latter over and above the load to be engaged. Each device may be first engaged at its lower end with the hook 62 on the load and then connected to the bridge member 59, as shown in Fig. 1. The engaging element at the lower end of each device may comprise a loop as shown in Figs. 1 and 5 or a hook as shown in Fig. 9. Where the load carries an engaging element centrally of its top wall, such element may be engaged by the outer device 57 or the member 47 may be provided with a device 57 inwardly of its free end and midway of its side edges. The hooks 62 are preferably mounted on a band 63 which surrounds the container. This band may be arranged at or near the upper end of the container when found desirable.

Figs. 13, 14 and 15 illustrate a construction of truck similar to that already described, but a differently constructed lift means, in which the elevating member 25a is provided with spaced lift devices 102 which engage the opposite sides of a container. In this form of construction, the lift devices being disposed horizontally on the upper end of the elevating member and being adapted to engage the annular shoulder α provided by the seam between the container head and body, as well as a reinforcement sometimes applied to the seam, the truck is capable of operating under the conditions already described. The outer portions of the lift devices are preferably curved to conform to the shape of the container.

The lift devices 102 are provided by extending the plates 83, also shown in Figs. 13 and 14. These plates are reinforced by an angle 103 and connected by a tie plate 104. Where the containers are arranged relatively close in side by side relation, as shown in Fig. 15, it is necessary to drive the truck and also slew the elevating member simultaneously in positioning a container in the row or in engaging the lift devices with a container to remove it and in removing the devices after positioning the container, either of such operations being shown in Fig. 15.

Figs. 16 to 20 illustrate a truck similar to that already described and in which the lift devices are adapted to engage the side portions of a

container. This illustrated embodiment of the invention differs from that shown in Figs. 13 to 15 in that the lift devices are movably mounted on the elevating member, so as to be projected into operative relation to a container or moved into retracted position, and means are provided for operating the lift devices.

Referring to these figures, 24' indicates the guides for an elevating member 25', the guides being mounted as already described. The side plates 83' of the elevating member are extended forwardly and connected by a bridge member 104', a pair of channels 105 being provided to secure them together. The bridge member extends laterally beyond the plates 83' for a reason which will later appear. 106, 106a, indicates pairs of guide elements secured to the lower side of the bridge member 104' outwardly of the plates 83'. 107 indicates a horizontal support connected to the lower sides of the guide elements. 108, 108 indicate lift devices slidable endwise between the guide elements 106, 106a, their upper and lower edges slidably engaging the bridge member 104' and support 107. The lift devices 108 are movable from the position shown in Fig. 16 to the position shown in dotted lines in this figure and in full lines in Fig. 17. The lift devices may be moved in either direction separately or together. For this latter purpose I provide on the lower sides of the guide elements 106, 106a, inwardly of the support 107, castings 109 having bearings for three shafts 110, 110a, 111, one end of the shaft 110 being provided with an operating member 112 and the remote end of the other shaft being provided with an operating member 112a. Each shaft 110, 110a, is provided with a sleeve shaft 113 having at its outer end an operating member 114. Each sleeve shaft 113 has fixed to it a pinion 115 which meshes with a rack 116 secured to the adjacent lift device and the adjacent shaft 110 or 110a has fixed to it a pinion 117 which meshes with the rack 116 secured to the other lift device. Accordingly, by operating either operating member 112a, 114, either lift device may be moved outwardly or inwardly. To provide for the simultaneous operation of both lift devices in either direction and from either side of the elevating member 25', I provide on the shafts 110, 110a, gears 118, 119, respectively, and on the shaft 111 I provide a rotatable gear 120, which is movable endwise of the shaft into and out of mesh with the gears 118, 119. When the gears 118, 119, 120 are in mesh, operation of either operating member 112, 112a, will serve to move both lift devices. The gear 120 is provided with a collar 121 having a groove into which fit pins carried on the bifurcated end of a lever 122, the latter being suitably pivoted on the support 107. The opposite end of the lever is connected to a pair of links 123 extending in opposite directions, each being slidably supported at its outer end portion in an opening formed in an angle 124 depending from the support 107 and carrying at its outer end a handle 125, whereby the lever 122 may be operated from either side of the elevating member to drivingly connect the shafts 110, 110a, together or disconnect them.

In the form of construction just described, the truck may be driven to a position opposite a container and the elevating member slewed or rotated the desired distance (see Fig. 16) and then the lift devices projected outwardly as shown in dotted lines. After lifting the load, the elevating member may be returned to normal

position. If the containers are stored in a manner which prevents the swinging of the elevating member to normal position, then such operation may be effected by swinging the member and simultaneously driving the truck as already described in connection with Fig. 15. Under these same existing conditions, these operations would be reversed when discharging a load.

While the embodiments of my invention are specially adapted to operate where containers are stored in the manner set forth, they also operate to handle containers under other conditions.

Each of the embodiments shown in Figs. 13 to 20 may be provided with slack take-up mechanism and limit switch mechanism, similar to that embodied in the form of construction shown in Figs. 1 to 12.

To those skilled in the art to which my invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope thereof. My disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

What I claim is:

1. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide thereon, an elevating member mounted to slide vertically on said guide, a lift member movably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load and having means for supporting a load engaging device, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to said elevating member and maintain it raised during raising and lowering thereof, and a stop on said elevating member to limit the upward movement of said lift member.

2. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide thereon, an elevating member mounted to slide vertically on said guide, a lift member swingably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load and having means for supporting a load engaging device, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to said elevating member and maintain it raised during raising and lowering thereof, and a stop on said elevating member to limit the upward swing of said lift member.

3. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide, means for rotatably supporting said guide on said frame, an elevating member mounted to slide vertically on said guide, a lift member movably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load, and having means for supporting a load engaging device, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to said elevating member and maintain it raised during raising and lowering

thereof, and a stop on said elevating member to limit the upward movement of said lift member.

4. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide thereon, an elevating member mounted to slide vertically on said guide, a lift member movably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load, a device depending from said lift member for engaging a load, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to and elevating member and maintain it raised during raising and lowering thereof, and a stop on said elevating member to limit the upward movement of said lift member.

5. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide thereon, an elevating member mounted to slide vertically on said guide, a lift member movably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load, a device depending from said lift member for engaging a load, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to said elevating member and maintain it raised during raising and lowering thereof, and a stop on said elevating member to limit the upward movement of said lift member.

6. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide thereon, an elevating member mounted to slide vertically on said guide, a lift member movably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load, a plurality of devices depending from the marginal edges of said lift member for engaging the sides of a load, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to said elevating member and maintain it raised during raising and lowering thereof, and a stop on said elevating member to limit the upward movement of said lift member.

7. In apparatus of the class described, the combination of a wheel mounted frame, a vertical guide, means for rotatably supporting said guide on said frame, an elevating member mounted to slide vertically on said guide, a lift member movably mounted on and projecting from said elevating member and arranged to be positioned over the top of a load, a plurality of devices depending from the marginal edges of said lift member for engaging the sides of a load, means for raising and lowering said elevating member, said means being connected to said lift member and serving to raise it relative to said elevating member and maintain it raised during raising and lowering thereof, and a stop on said elevating member to limit the upward movement of said lift member.

EDWARD H. REMDE.